Effect of nutritional status on the presence of malnutrition and quality of life in patients with gastrointestinal tract cancer

Nutritional status and quality of life in patients with gastrointestinal system cancer

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Abstract

Aim: Cancers affecting the gastrointestinal tract are common worldwide, and cancers of the stomach and pancreas have a poor prognosis. Supporting nutritional status before, during and after cancer treatment improves the effectiveness of treatment and quality of life. Malnutrition is seen in cancer patients due to loss of appetite, nausea, vomiting, diarrhea, chewing or swallowing problems, taste and smell changes, therefore malnutrition should be evaluated in all cancer patients and appropriate nutritional support should be initiated. In this study, we aimed to evaluate the effect of nutritional status on malnutrition and quality of life in patients with gastrointestinal system cancer.

Material and Methods: The cross-sectional study included 60 patients who received gastrointestinal system treatment and met the inclusion criteria. The Quality of Life Test (EORTC QLQ-C30) and NRS-2002 were administered to the patients by the investigator using a face-to-face method. Socio-demographic information, anthropometric measurements and biochemical findings were obtained from patient files with hospital permission.

Results: In the study, most of the patients were at risk of malnutrition; however, no significant correlation was found between NRS 2002 and quality of life and cancer stages. There was an inverse relationship between albumin levels and malnutrition risk (p<0.05).

Discussion: Cancer patients are at risk of malnutrition due to the heavy treatment brought by the disease, therefore, malnutrition risks should be determined in the early period, appropriate nutritional support should be provided and their quality of life should be improved.

Keywords

Malnutrition, Quality of Life, Cancer

Introduction

Cancer is a multi-stage disease of cell differentiation and death and is responsible for approximately one in six deaths worldwide; however, one-third of cancer-related deaths are associated with high body mass index, inadequate fruit and vegetable intake, physical inactivity, tobacco and alcohol use [1]. Cancers affecting the gastrointestinal tract (GI) are common worldwide and their incidence is increasing day by day; among them, gastric and pancreatic cancers have a poor prognosis and are difficult to treat [2]. Supporting nutritional status before, during and after cancer treatment increases the effectiveness of treatment and quality of life. The European Society for Clinical Nutrition and Metabolism recommends the measurement of resting energy expenditure for all cancer patients through the use of indirect calorimetry; however, in the absence of this measurement in clinical practice, nutritional requirements can be estimated as 105-126 kJ/kg/day with 1·2-1·5 g protein/kg/day [1]. GI cancer patients are at risk of malnutrition due to metabolic, physiological, physical and psychological changes associated with treatment and disease, and cancer cachexia and sarcopenia are reduced by identifying the risk of malnutrition and initiating nutritional support [3]. Malnutrition may be observed in cancer patients due to loss of appetite, nausea, vomiting, diarrhea, chewing or swallowing problems, taste and smell changes and this condition accounts for 30-50 percent of deaths in patients with GI tract cancer. In case of malnutrition screened in the early period, food intake and body weight changes should be examined and according to the European Society for Clinical Nutrition and Metabolism (ESPEN), malnutrition should be evaluated in all cancer patients and appropriate nutritional support should be initiated. Albumin, prealbumin, transferrin and retinol binding protein are biochemical parameters frequently used in the evaluation of malnutrition status. The serum albumin level is also a good marker for the assessment of malnutrition risk; however, it is insufficient alone. In addition to screening tests, nutrition-related biochemical parameters, especially albumin, C-reactive protein (CRP) and neutrophil biochemical parameters are widely used in the evaluation of malnutrition. Since these parameters vary depending on infection, dehydration, renal failure and liver dysfunction, they are not sufficient alone in the evaluation of nutritional status [4]. In addition, 10-15 percent weight loss within six months, body mass index <18.5 kg/m2, Malnutrition Screening Test (NRS-2002) score >3 and serum albumin level <3.0 also indicate the presence of malnutrition [3]. Screening of patients with early malnutrition screening and the development of appropriate nutrition plans will support the cancer treatment processes of patients. Therefore, the nutritional status of patients should be screened in the early period and appropriate intervention should be applied without wasting time. With timely and adequate nutritional support, patients' quality of life improves, hospitalization levels decrease and complications are minimized [2]. In this study, we aimed to evaluate the effect of nutritional status on malnutrition and quality of life in GI tract cancer patients with oral food intake.

Material and Methods

Patients' Population

The study participants were selected from patients diagnosed with GI cancer who received chemotherapy treatment at the oncology service of VM Medical Park Göztepe Hospital between January and July 2018. To be included in the study, they had to have the following characteristics (a) not have a chronic disease other than GI cancer; (b) be on an oral diet; (c) receive chemotherapy treatment; (d) be over 18 years of age. Pregnant or breastfeeding women with a cancer diagnosis other than metastasis were excluded.

The study was conducted in accordance with the Declaration of Helsinki, ethics committee approval was obtained by Bahçeşehir University Non-Interventional Clinical Research Ethics Committee with the decision dated 6/12/2017 and numbered 2017-19/01, and informed consent was obtained from each participant.

Study Design

This was a cross-sectional study, and participants were informed about the benefits and potential risks of the study at baseline. The Quality of Life Test (EORTC QLQ-C30) and NRS-2002 were administered to the patients by the researcher using the face-to-face method. Socio-demographic information, anthropometric measurements and biochemical findings were obtained from patient files with hospital permission.

Assessment of Nutritional Status and Detection of Malnutrition Risk

The NRS-2002 test was used to evaluate the malnutrition status of patients with GI tract cancer. The test includes two stages and in the first stage, the patient's body mass index (BMI), weight loss in the last 3 months, change in food intake in the last week and the level of the disease are questioned, and if the answer to any of these four questions is 'Yes', the second stage of the questionnaire is started. In the second stage, the percentage of weight loss, nutrient intake and level of disease are questioned and a total score between 0-6 is given; if the patient is 70 years of age or older, the malnutrition score is calculated by adding one more point to the total score. If the total score is equal to or more than 3, there is a risk of malnutrition; if it is less than 3, there is no risk of malnutrition, but the screening test should be repeated every week [5].

Evaluation of Quality of Life

The EORTC QLQ-C30 scale for cancer patients was used to assess quality of life. This scale includes five different assessment sections (physical, functional, emotional and social) and symptom scales such as fatigue, nausea, pain and vomiting, with scores ranging from 0 to 100. The score for the first part (the symptom part) is inversely proportional to the patient's condition and the score for the second part (the self-assessment part) is directly proportional to the patient's level of health [4].

Statistical Evaluation of Data

SPSS (Statistical Package for Social Sciences) for Windows 16.0 program was used for statistical analysis of the data obtained. In the descriptive statistics of the data, mean,

minimum, maximum values and standard deviation were used, the differences between the data were evaluated by the Mann-Whitney U Test and Spearman's correlation analysis, and the Kruskal-Wallis test was used in the relationships between them. Significance levels were p<0.05.

Laboratory tests

Liver function tests, albumin, hemoglobin, eosinophil and lymphocyte parameters were obtained from patient files. Laboratory tests of the patients were measured and evaluated at Medicalpark Göztepe Hospital Laboratories.

Ethical Approval

Ethics Committee approval for the study was obtained.

Results

The study included 60 patients; however 5 patients were excluded from the study because they had a chronic disease as well as gastrointestinal system cancer and the study was completed with 55 GI system cancer patients.

Baseline characteristics of patients

A total of 55 patients, 25 women and 30 men were included in the study. Of the participants, 12.7% were nonliterate, 27.3% were primary school graduates, 18.2% were middle school graduates, 29.1% were high school graduates and 12.7% were undergraduate graduates. BMI values of the individuals were as follows: 23.6% were underweight, 38.2% were normal, 16.4% were overweight and 21.8% were obese (Table 1).

Disease-related data

The distribution of patients by cancer stage was as follows: 12.7% had stage 1, 30.9% had stage 2, 38.2% had stage 3 and 18.2% had stage 4. Metastasis was seen in 43.6% of the individuals who participated in the study, while 56.4% had no metastasis (Table 1).

Table 1. Baseline characteristics of patients.

Variable	Group	Ss	%
Sex	Female	25	45,5
	Male	30	54,5
Education Level	Illiterate	7	12,7
	Primary school	15	27,3
	Secondary School	10	18,2
	High school	16	29,1
	Undergraduate	7	12,7
Body Mass Index	≤ 18.5	13	23,6
	18.5-24.9	21	38,2
	25-29	9	16,4
	≥30	12	21,8
Cancer Stage	1. Stage	7	12,7
	2. Stage	17	30,9
	3. Stage	21	38,2
	4. Stage	10	18,2
Nutritional Risk	Risk Exists	51	92,7
	No Risk	4	7,3
Metastasis	Yes	24	43,6
	No	31	56,4
Total		55	100

Ss: Standard deviation; %: Percent

Table 2. Comparison of NRS2002 and quality of life according to metastasis status.

Variable	Groups	U	p
NRS2002 Scores	Metastasis Yes	306	0,24
	Metastasis No		
Quality of Life Scores	Metastasis Yes	342,5	0,61
	Metastasis No		
Self-Assessment	Metastasis Yes	350,50	0,70
	Metastasis No		
Quality of Life Scores	Malnutrition Risk Yes	102	1
Self-Assessment	Malnutrition Risk No	33,5	0,02*

U: Mann-Whitney U; p<0,05.

Table 3. Relationship between NRS2002 scores, quality of life and self-assessment scores of individuals and intake of blood findings.

	NRS2002 Scores		Quality of Life Scores		Self Evaluation Scale	
	r	p	r	p	r	p
Alanine Aminotransferase	-0,13	0,36	0,16	0,26	-0,19	0,16
Aspartate Aminotransferase	0,19	0,16	0,04	0,76	-0,05	0,73
Urea	0,07	0,63	0,02	0,86	-0,03	0,83
Albumin	0,21	0,01*	0,19	0,17	0,03	0,82

†: Spearman's correlation test; p<0,05.

Malnutrition risk and quality of life

According to the NRS-2002 score, 92.7% of the patients were at risk of malnutrition and 7.3% were not at risk of malnutrition. NRS-2002 and Quality of Life scores of patients with and without metastases did not differ. No significant correlation was found between NRS-2002 and Quality of Life scores and metastasis status. There was no significant difference between Quality of Life, self-assessment and NRS-2002 score according to cancer types. There was no significant difference between the Quality of Life scores of the patients according to the risk of malnutrition; however, there was a significant difference between the scores of the second part of the self-assessment scale (p<0.05). Quality of Life, self-assessment scores and NRS-2002 score swere found according to cancer stages and there was no significant difference between these values (Table 2).

Laboratory tests

There was a statistically positive and significant relationship between NRS-2002 scores and albumin levels (p<0.05). However, none of the relationships evaluated with other blood findings were statistically significant (p>0.05), (Table 3).

Discussion

In our study, a large proportion of patients were at risk of (%92.7) malnutrition. Therefore, the nutritional status of patients should be screened in the early period and appropriate intervention should be applied without losing time. With timely and adequate nutritional support, patients' quality of life increases, hospitalization levels decrease and complications are minimised. However, no significant relationship was found

between NRS 2002 and quality of life. According to a study in which malnutrition risk screening was performed with NRS-2002 in cancer patients, 24.8% of patients were at moderate risk and 15.4% were at high risk [2].

In the study evaluating the effects of nutritional intervention on patients' quality of life in GI cancer patients receiving chemotherapy treatment, quality of life scores of the patients in the intervention group were found to be higher after the intervention compared to the control group (p<0.05) [6]. In another study evaluating the quality of life scores of patients with GI tract cancer, it was reported that quality of life scores decreased with prolonged duration of chemotherapy treatment (p<0.05) [7]. In our study, no significant difference was found between quality of life, self-assessment score and NRS-2002 scores according to cancer stages. This showed that cancer stage alone was not only effective in determining the quality of life of the patients, but also many different physiological and psychological conditions affected the quality of life. According to the risk of malnutrition, there was no significant difference in the quality of life score of the patients; however, there was a significant and inverse relationship between the sub-section of self-assessment scores.

In cancer patients over 30 years of age, with gastrointestinal system cancer, stage III or IV, receiving radiotherapy or chemotherapy, quality of life and self-assessment scores were evaluated and it was reported that the quality of life of the patients was inversely related to their malnutrition status and symptoms [8]. In our study, no significant difference was found between Quality of Life, Self-Assessment Scores and NRS2002 Malnutrition Screening Test Score according to cancer stages. The Quality of Life scores of patients with and without malnutrition risk did not differ, but there was a significant difference between the Self-Assessment scores of the patients (p<0.05). This shows that not only cancer stage is effective in determining the quality of life of patients, but many psychological and biological conditions affect the quality of life, and the psychological support received by patients with gastrointestinal system cancer participating in our study may be effective for life expectations and health beliefs.

In a study evaluating the preoperative malnutrition risks and quality of life of patients with GI tract cancer, a significant inverse correlation was found between malnutrition status and quality of life (p<0.05) [9]. In our study, the Quality of Life scores of patients with and without malnutrition risk did not differ; however, there was a significant difference between Self-Assessment.

In a study evaluating the effect of oral nutrition intervention on postoperative malnutrition status and quality of life in patients with GI tract cancer, the group receiving oral nutrition intervention for three months showed a significant difference in BMI values and improved quality of life compared to the control group (p<0.01) [10].

Low serum albumin levels have been reported to be a positive marker for the detection of malnutrition risk with the NRS2002 malnutrition screening test in cancer patients [11]. In a study evaluating the effect of nutritional support for 6 weeks on the malnutrition status and quality of life of 96 esophageal cancer patients receiving chemotherapy and radiotherapy treatment,

serum albumin levels and quality of life were significantly higher in the intervention group compared to the control group [12]. In our study, most of the patients were malnourished and there was a statistically significant relationship between NRS 2002 scores and albumin levels (p<0.05). However, none of the relationships evaluated with other blood findings were statistically significant.

Conclusion

Nutritional status in patients with GI cancer leads to malnutrition and worsening of the quality of life. Studies evaluating the presence of malnutrition and its relationship with quality of life in these patients are limited, and there is a need for studies that examine survival rates and quality of life of patients with GI cancer with wider parameters and include more participants.

Limitation

Due to the strict inclusion criteria in our study, the number of patients was small and should therefore be considered as a pilot study.

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